

<b>Module Title</b> <b>Oil And Gas Engineering A</b>  <b>Keywords</b> Well Engineering, Drilling Fluids, Drilling Hazards, Materials, Corrosion.	Reference	EN4580
	SCQF	SCQF
	Level	10
	SCQF Points	15
	ECTS Points	7.5
	Created	May 2002
	Approved	March 2004
	Amended	August 2011
	Version No.	2

## This Version is No Longer Current

The latest version of this module is available [here](#)

### Prerequisites for Module

Offshore Engineering (EN3581).

### Corequisite Modules

None.

### Precluded Modules

None.

### Aims of Module

To provide the student with the ability to evaluate the theory and practice of drilling engineering; with particular reference to the oil/gas industry.

### Learning Outcomes for

7. Drilling Hazards. Causes, Prevention and Control measures for: Formation Damage; Sloughing Shales; Washouts; Mud Contamination; Lost Circulation; Stuck pipe; pressure Surge and Swabbing; Kick and Blowout.

### Indicative Student Workload

	Full	Part
<i>Contact Hours</i>	Time	Time
Assessment	10	10
Lectures	40	40
Tutorials	10	10
<i>Directed Study</i>		
Directed Study	20	20
<i>Private Study</i>		
Private Study	70	70

## **Learning Outcomes for Module**

On completion of this module, students are expected to be able to:

- 1.Explain materials corrosion mechanisms and control techniques.
- 2.Appraise the equipment and processes involved in drilling a well.
- 3.Explain drilling fluids technology including type, properties and flow behaviour.
- 4.Asses the hazards involved in drilling and the preventive measures.

## **Indicative Module Content**

1. The Drilling Process: Basic Stress/Strain theory, Definition of Principal stresses; Theories of rock fracture and factors relating to penetration rate and direction control; Bit types and selection. 2. Drilling Equipment: Rotary drilling techniques for Vertical and Directional wells; derrick design. 3. Basic Principles of Well Planning & Construction: Definition of hole sizes versus casing sizes/setting depths; Directional Planning; Casing and Cementing programme Design. 4. Properties of

## **Mode of Delivery**

This is a lecture based module supplemented by tutorials and case studies or coursework.

## **Assessment Plan**

	Learning Outcomes Assessed
Component 1	1
Component 2	1,2,3,4

Component 2 is a closed book examination (70% weighting).

Component 1 is a single case-study based coursework (30% weighting).

## **Indicative Bibliography**

- 1.RABIA, H., 1985. Oilwell Drilling Engineering-Principles and Practice. London:Graham & Trotman.
- 2.GATLIN, C.,1960. Petroleum Engineering - Drilling and Well Completions. Eaglewood Cliffs, NJ: Prentice Hall).
- 3.CHILINGAR, G.V., 1983. Drilling and Drilling Fluids. Amsterdam : Elsevier.
- 4.JOSHI, S.D., 1991. Horizontal Well Technology. Tulsa, Okla : Penwell Books.

Design and properties of materials and failure mechanisms including corrosion mechanism and control. 5. Drilling Fluids, Functions and Types: Drilling Fluids Classification: Newtonian and Non-Newtonian - Power law, Herschel Bulkley and Bingham Plastic fluids; Fluid Mechanics of drilling fluids: Flow of Slurries and pressure drop calculations for flow in pipes and annulus. 6. Drilling Hydraulics: Measurement of drilling fluids properties: Introduction to basic instruments - Mud balance, Viscometers, Filtration cells, Retort kit, etc

5. BOURGOYNE (Jr) A. T., CHENEVERT, M. E., MILLHELM, K. K. & YOUNG, F. S., 1986. Applied Drilling Engineering. SPE Textbook Series, Vol 2
6. BYARS, H. G., 1999. Corrosion Control in Petroleum Production, TPC Publication 5; (2nd Edition); NACE Inter; Houston